

The Biology of Mayflies With a Systematic Account of North American Species. By James G. Needham, Jay R. Traver, Yin-Chi Hsu, assisted by specialists in certain subjects. Ithaca, New York, Comstock Publishing Company, Inc., 1935. XVI + 759 pp., 42 pl., 165 fig., col. front. \$7.50.

It is 137 years since Dr. Hugh Williamson read before the American Philosophical Society his description of and observations on *Ephoron leukon*, apparently the first American mayfly to be described. Previous to that time, or in 1749, John Bartram, the botanist, had made some observations that were published a year later in the Transactions of the Royal Society of London. Following these two men, Thomas Say described some, then Hermann A. Hagen and Benjamin D. Walsh. These men were the early workers. After Hagen's "Synopsis of the Neuroptera of North America" with its 45 species of mayflies, in 1861, there came in 1892 Nathan Banks' "Catalogue of Neuropteroid insects" with 86 species and in 1907 his second catalogue with 102 species. Now we have a work by Dr. Needham and his colleagues containing descriptions of 507 species, forty-eight of which are new to science. And the authors, after bringing together in 739 pages not only their own work and observations but all the contributions of other workers, modestly hope that the little that is presented about this neglected order will form a substantial basis for future work. There is no doubt about their work being a substantial basis for future activity, nor of the stimulating effect it will have on students, but I fear that many years will pass before the entomological world will have a more comprehensive work than the present one. Approximately one-third of the book is occupied with chapters on life-history, structure of the adult and nymph, internal anatomy, postembryonic development, eggs and egg-laying habits, embryonic development, taxonomic characters of the adult, studies on the wings, legs, the body wall of the thorax, the musculature of the thorax, nymphal structures and adaptations, the evolution of mayflies, enemies, collecting, rearing and preservation. The remaining two-thirds of the book are concerned with classification, redescriptions, descriptions of new species, keys to adults and nymphs and verification tables that supplement the keys, together with a bibliography and index.

The book should appeal to collectors, teachers, taxonomists, anatomists, and students of entomology in general, because it is the most exhaustive and adequate monograph on all aspects of the North American Ephemeroptera that has ever appeared.

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